REMARKS

This is in response to the Office Action of June 13, 2008. Claims 5-7, 9-13, 15-19, and 21-26 are cancelled, without prejudice. Claim 1 is amended to recite a polyether sulfone support, based upon such disclosure as that in the first paragraph on page 26 of the specification ("Materials for the support ... [should] ... have chemical and thermal stability. Specific examples of such materials include ... polyether sulfones"). Claim 1 is also amended to recite a flat layer, based upon original claim 5, and claim 1 is further amended to recite the materials from which said flat layer is made, based upon original claim 6. As taught in Applicant's specification, beginning in line 8 on page 7, "A flat layer may be formed on the first substrate, and the organic layer may be transferred onto the flat layer. The maximum surface roughness Rmax (JIS B 0601-1982) of the first substrate, to which the organic layer is transferred, can be controlled by forming the flat layer." New claim 27 is added, based upon original claim 2. New claim 28 is added, based on disclosure in lines 13-18 on page 26 of the specification. New claim 29 is added, based on disclosure in the paragraph bridging pages 6-7 of the specification. New claim 30 is added, based on disclosure in lines 21-23 on page 20 of the specification. No new matter is added to the application by this Amendment. Claims 1, 3, 4, and 27-30 are now pending in the application.

Claim objections

On pages 2-3 of the Office Action, the Examiner objected to claims 1, 7, 13, and 19 and also to claims 5, 6, 11, 12, 17, 18, 23, and 24. Applicant respectfully submits that the claims as amended hereinabove are free of the grounds of objection stated in the Office Action.

Claim rejection - 35 USC § 112, ¶ 2

On page 3 of the Office Action, the Examiner rejected claims 1, 7, 13, and 19 as failing to define the invention properly with regard to their recitation of "the transfer temperature." The phrase in question no longer appears in the claims. Accordingly, this ground of rejection is rendered moot by the present Amendment.

Rejection over Akai, Mueller, and Nakaya

Claims 1, 3-7, 9-13, 15-19, and 21-26 were rejected over US 2003/0045021 A1 (Akai '021) in view of US 6,432,741 B1 (Mueller) and US 6,188,176 B1 (Nakaya). Office Action, pages 4-8. The rejection is respectfully traversed.

The invention

Claim 1 in its present form is drawn to "A method for producing an organic electroluminescent device by using a transfer material comprising at least one organic layer formed on a support made of polyether sulfone, comprising the steps of superposing said transfer material on a flat layer formed on a first substrate having a first electrode formed at least partially on said flat layer such that said organic layer of said transfer material faces said first electrode on said first substrate; applying heat and/or pressure thereto to form a laminate; and peeling said support from said laminate so that said organic layer is transferred onto said first substrate via said first electrode, wherein said flat layer is made of at least one material selected from the group consisting of ultraviolet-curing organic compounds, electron beam-curing organic compounds, thermosetting organic compounds, inorganic oxides, and inorganic nitrides, and wherein said flat layer formed on said first substrate has a maximum surface roughness Rmax in the range of 0% to 50% obtained from a ratio of a maximum surface roughness Rmax (nm) of said flat layer to the thickness (nm) of said organic layer."

That is, major distinguishing features of the method of Applicant's invention are as follows:

(1) using a transfer material comprising at least one organic layer formed on a support made of ***polyether sulfone***;

(2) comprising the steps of

(a) superposing said transfer material ***on a flat layer formed*** on a first substrate having a first electrode formed at least partially ***on said flat layer*** such that said organic layer of said transfer material faces said electrode on said first substrate;

(b) applying heat and/or pressure thereto to form a laminate; and

(c) peeling said support from said laminate so that said organic layer is transferred onto said first substrate via said electrode;

(3) ***said flat layer is made of at least one material selected from the group consisting of ultraviolet-curing organic compounds, electron beam-curing organic compounds, thermosetting organic compounds, inorganic oxides, and inorganic nitrides***;

(4) ***said flat layer formed on*** said first substrate has a maximum surface roughness Rmax in the range of 0% to 50% obtained from a ratio of a maximum surface roughness Rmax (nm) of ***said flat layer*** to the thickness (nm) of said organic layer.

In accordance with the present invention, the aforementioned organic layer can be easily formed on a substrate to produce a uniform organic electroluminescent device with a good lamination interface. This electroluminescent device is useful for full-color display devices, backlights of liquid crystal display devices, illumination surface light sources, light source arrays of printers, and so on. Specification: page 1, lines 5-10; page 30, lines 4-18.

No *prima facie* obviousness

In contrast to Applicant's invention, Akai '021 discloses a method for producing an organic electroluminescent (EL) device by forming a first electrode on a substrate, forming an organic film including a light emitting layer on the first electrode, forming an electrically conductive and light transmissive protection layer on the organic film and forming a transparent second electrode on the protection layer by a sputtering method. Akai '021 further teaches, in paragraph [0047], that the substrate to be used may be transparent or non-transparent, and that materials for the substrate are not limited so long as the substrate is sufficiently rigid to support the organic EL device. Examples of the substrate in Akai '021 include silicon substrates, polyimide films, ceramic substrates, glass substrates, and insulated metal substrates.

Mueller discloses organic opto-electronic devices with flip-chip organic opto-electronic structures. The Mueller devices include at least two separate parts, each part comprising an electrode and at least one of these electrodes carrying an organic stack. After manufacture of these separate parts, both are brought together to form the complete opto-electronic device and spacers are integrated on one or both sides of the parts. Specifically, Mueller teaches a first embodiment comprising a first substrate 11 (silicon) carrying an electrode 12 and two spacer halves 13, the corresponding spacer halves 15 formed on a second substrate 16 (glass), which comprises an organic stack 14 and a common electrode 17 in a manner such that such organic stack at least comprises a light emitting layer where light is generated if an appropriate voltage is

applied across the electrodes in Figure 1A of Mueller. See column 6, lines 4-14, the Table in column 6, and Figure 1A in Mueller. In addition, Mueller teaches a flip-chip organic light emitting device 10 shown in assembled form in Figure 1B therein. In this device, the two substrates 11 and 16 are flipped together such than an intimate contact is provided between the electrode 12 and the organic stack 14. The spacer halves 13 and 15 set the distance (D) between the two substrates 11 and 16, so that these spacers precisely define the forces (pressure and stress) acting upon the electrode 12 and the organic stack 14. See column 6, lines 14-22 and Figure 1B or Mueller.

Nakaya discloses an organic EL device comprising a substrate having a surface, a hole injecting electrode disposed on the substrate surface, an electron injecting electrode, and at least one organic layer disposed between the electrodes, the hole injecting electrode comprising a tin-doped indium oxide (ITO) electrode having (111) orientation. The substrate may have a mean surface roughness Ra of up to 10 nm and a maximum surface roughness Rmax of up to 50 nm. The ITO electrode at its surface remote from the substrate may have a mean surface roughness Ra of up to 10 nm and a maximum surface roughness Rmax of up to 50 nm. See Nakaya, column 2, lines 9-23. Also, Nakaya teaches the use as the substrate of transparent or translucent materials such as glass, quartz, and resins. Column 3, lines 57-58.

None of Akai '021, Mueller, and Nakaya teaches or suggests distinguishing features (1) to (4) of Applicant's invention noted above – particularly the use of polyether sulfone as the substrate. Accordingly, the prior art fails to establish a *prima facie* case of obviousness with respect to the present invention.

Unexpected results

Nevertheless, Applicant presents herewith a Declaration under 37 CFR §1.132 to provide further evidence of unexpected beneficial properties provided by Applicant's invention. Additional comparative experiments were conducted, in which transfer materials were prepared using polyether sulfone for the substrate as in the present invention and using polyethylene terephthalate and polyethylene naphthalate substrates as comparative technology. The results, reported in the Declaration, may be summarized as follows:

Example	*Support*	*Transferability*	*Laminatability*
Example 1	polyether sulfone (thickness: 118 μm)	excellent	excellent
Add'l. Comp. Exam. 1	polyethylene terephthalate (thickness: 50 μm)	poor	excellent
Add'l. Comp. Exam. 2	polyethylene naphthalate (thickness: 50 μm)	poor	excellent

Unexpectedly, in the cases tested, transferability of the light-emitting organic layer is excellent when the transfer material is prepared by forming a flat layer on the surface of the first substrate and using polyether sulfone as the support for the transfer material. In contrast, transferability of the light-emitting organic layer is poor when the transfer material is prepared by forming a flat layer on the surface of the first substrate and using polyethylene terephthalate or polyethylene naphthalate as the support for the transfer material. Nothing in the prior art (Akai '021, Mueller, or Nakaya) would lead a person of ordinary skill in the art to this surprising discovery.

Accordingly, Applicant's invention is not only without technological basis in the prior art disclosure, it also provides benefits that are unexpected with respect to the prior art disclosure.

Rejection over Mueller and Nakaya

Device (product-by-process) claims 13, 15-19, and 21-26 were rejected as being unpatentable over Mueller in view of Nakaya. Office Action, pages 8-10. This ground of rejection is rendered moot by the cancellation of the device claims from the present application.

Conclusion and contact information

Applicant respectfully submits that the present amendments and arguments serve to obviate all rejections of record. If there are any questions, the Examiner is invited to contact Richard Gallagher, Registration No. 28,781, at (703) 205-8008.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

By _____

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